DELIVERABLE D6.2

IPv6 based secure communication

Annex 1

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Annex 1. Scenario Exercise to draw out Project Secricom User Requirements

Introduction

Project Secricom is an EC funded initiative aiming to improve the response to crisis management operations during catastrophic natural and man made incidents. The project has two essential ambitions:-

(A) Solve or mitigate problems of contemporary crisis communication infrastructures (Tetra, GSM, Citizen Band, IP, satellite) such as poor interoperability of specialised communication means, vulnerability against tapping and misuse, lack of possibilities to recover from failures, inability to use alternative data carrier and high deployment and operational costs.

(B) Add new smart functions to existing services which will make the communication more effective and helpful for users. Smart functions will be provided by distributed IT systems based on an agents' infrastructure. Achieving these two project ambitions will allow creating a pervasive and trusted communication infrastructure fulfilling requirements of crisis management users and ready for immediate application.

A critical success factor for the project is to hold a demonstration exercise to illustrate the above capabilities in a test environment. It was agreed at the initial project 'Kick off' meeting in Brussels on 23 September 2008 that the best way to capture requirements for technical project partners to progress towards the final demonstrator test was for a crisis scenario(s) to be developed by informed users so that communication needs could be identified and drafted into requirements. At this stage it is unknown how the demonstration exercise will operate or be evaluated although it is intended that it will be shaped around the drafted scenario detailed for the initial requirements capture.

On October 24 in Portsmouth UK an initial user workshop was held. User team members were briefed on the project's scope, aims and met core project team representatives. It was agreed at this meeting that the user team had the capabilities and knowledge to develop the required scenario.

A subsequent user meeting on November 4 at New Scotland Yard London reviewed and developed the following scenario with a list of outline requirements being highlighted. Subsequent refinements to both the scenario and the outline requirements have been undertaken. (See appendix A for the agencies and roles involved in the user team)

The following outlines a plausible (not necessarily totally realistic) crisis scenario with various inter agency and inter user communications needs being identified; further iterations of this document will provide greater granularity and greater detail on requirements but at this stage a scenario outline which encapsulates the breadth of potential requirements is the first product and the subject of this paper.

Assumptions

- It is assumed at this stage that the scenario drafted to elicit the technical requirements to guide development within the project will also be the basis of the final demonstrator test
- It is assumed at this stage of the project for the basis of drafting the scenario for technical requirements that whilst the project has a European wide focus that the UK event management doctrine for emergency agencies namely strategic, incident command and ground command levels will form the basis of the operational structure within which communication needs will be identified.
- It is also assumed that other European countries will have a similar structure. It is further assumed for the scenario that affected countries can communicate with each other in a common language; it is acknowledged in reality documents transferred between countries could require translation but this is not a consideration for this scenario
- It is assumed for the basis of the scenario for requirements that the lowest common denominator of existing technical capability can be utilised by a 'player' in the scenario.
- It is assumed for all agencies included in the scenario there is a responsibility that 'business as usual' has to be managed in other parts of the district/region
- It is assumed that the incident highlighted in the scenario will attract a range of non-professional responders
- It is assumed in the scenario that there is no operational level communications between the emergency agencies of Countries A & B other than fixed and mobile phone, fax and internet
- It is assumed that Country A in the scenario does have contingency plans for this region but they have not been exercised recently (nor jointly with country B)
- It is assumed that inter-agency and inter government protocols are in place or are established very early on in the scenario for emergency agencies to work together across the international borders
- It is assumed that strategic command is in a fixed environment which is pre –equipped and at a state readiness
- It is assumed that incident command will be a deployed infrastructure solution for all agencies identified in the scenario – mobile command vehicles (fully equipped) and supporting temporary communications infrastructure
- It is assumed at ground command level and below (the 'doers') that mobility capability on communications is an absolute requirement

Scenario Guide

The approach taken to the production of the scenario will be iterative with the aim of adding additional layers of detail as the document develops. This document is the first layer with its primary aim being breadth of perspective.

After the scenario introduction there are various serials described outlining different sub scenarios or vignettes aimed at drawing out specific communication issues; in subsequent iterations these sub scenarios will be further developed as required to provide sufficient detail for the technical requirements for the project.

Care has been taken within the scenario to minimise highlighting issues around national policy, different agency's business procedures and operating protocols; the purpose of the document and future iterations is to draw out communications needs, however it is acknowledged some reference to policy and procedure may emerge as they could be central to an identified communications need.

Outline Scenario - Introduction

In Country A, a very large reservoir owned by a Water Company (or Local Authority/ Corporation/Municipality) that feeds off a major river has over recent weeks undergone substantial and much needed restoration work on its retaining walls. Coincidently shortly after the restoration work commenced there has followed a sustained period of heavy rain in the nearby mountains that sources the aforementioned river. This has in turn led to increasing water levels that are now approaching the capacity of the reservoir and placing increasing pressure on retaining walls that are still not fully repaired.

It is now estimated by experts that within the next 72 hours the southerly walls of the reservoir will breach and flood down an adjacent valley which contains a large urbanised area with residential housing, a chemical plant, a power plant; also major transport infrastructure (road and rail). This urbanised area is a border town and a major access route into a neighbouring country (B) further down the valley (1 km away); there is also on the western side of the valley a 0.75 km road tunnel that links the two countries.

At the foot of the valley in the adjacent country by the border crossing is a spit of flat land 250 metres wide that is a popular nature reserve; this then leads into a deep natural sea harbour that is home to several species of wildlife and is a protected environmental location

Serial 1 Strategic Command

(Seamless communications across and within core & support agencies - security, reliability & auditability)

A strategic command centre has been established 5 miles north from the reservoir; all agencies involved in this incident have been involved in the frequent co-ordinating meetings established to manage this incident. Each agency has its own HQ within the region and its own communications infrastructure; some agencies have a very sophisticated infrastructure others are quite basic.

Planning support teams (in support of strategic level command) from the various agencies are exchanging large amounts of information so that there is a common picture and understanding of the growing crisis.

The agencies involved, under a lead co-ordinator, initially are as follows:-

- Police
- Fire
- Ambulance and medical services & Hospitals
- Local Authorities
- Environment agency
- Weather agency
- Health agency

Following initial impact assessments further agencies are engaged

- Military
- Rail and Road transport agencies
- Gas and electricity utility providers
- Telephony providers fixed and mobile
- Chemical plant
- Power station
- Voluntary sector
- Country B liaison – opposite 'numbers' – Civil Defence

After 8 hours the situation has now reached the stage whereby at the strategic level agencies impact assessments are leading to the co-ordination of there own resources through their own command structure whilst also liaising with each other via various communication links within the strategic co-ordinating command centre.

Liaison has also taken place with country B through formal channels and it has started to set up a similar co-ordinating group of response agencies. Increased communication is also starting to take place between the respective country's responsible agencies at sub strategic levels.

The overall agreed strategy at this stage is:-

- Preservation of Life
- The minimising of damage to property
- The minimising of disruption to affected communities
- Preservation of environment – chemical plant concerns in both country A and B
- The restoration of normality at the earliest opportunity

- The securing of evidence for the public enquiry (already announced) as to the reasons for this impending crisis.

Serial 2 Incident Command

(Seamless communications across and within core and support agencies, and across international borders – security, reliability, quality & auditability)

The overall strategy is communicated and documented to the various agency Incident commanders. After 10 hours a joint agency Incident command post (or forward command) for all involved agencies has been established at a school on high ground above the valley under threat; it has basic telecommunications – landline telephone, internet and has good commercial mobile phone coverage within its premises. At the respective Agencies HQs planning and logistics teams are forming to support this level of command.

At the school the core emergency responders have also set up their own legacy communications; the other supporting agencies have senior management on site with an array of communications systems ranging from quite refined (military) to mobile phones and some satellite capability (utilities and local authority).

The school grounds are acting as a marshalling area for all resources tactically deployed to this incident with good access and egress routes to the valley under threat. The school is also operating as a tactical level briefing and de-briefing point for staff from all agencies that are deployed operationally on various sites within the valley.

The individual tactical plans as drafted by the incident commanders are now communicated to the various ground commanders. Leading on from the strategy and after consultation with relevant experts various tactical options have been agreed. The relevant ground commanders of agencies concerned are now directing resources accordingly. Within each designated tactical area (ground command) further forward commands have been established as have smaller marshalling areas for vehicles, equipment etc

At this stage agreement has been reached for respective incident and ground commanders from countries A & B to liaise with each other as required.

Serial 3 Ground Command Evacuation

(Seamless communications across and within core and support agencies - security, reliability, quality & auditability) after 18 hours

The western half of the residential area is considered most at risk and consequently an evacuation of all properties in this area is underway. This requires ground command coordination between several agencies. Various utilities are also making safe their infrastructure in the threatened area. At this stage ground commanders are making use of any fixed infrastructure within their command area e.g. police, fire or ambulance stations, local authority premises or vacant offices. Activities in this sector involve:-

- Agreement of traffic routes to safe ground,
- Provision of buses for those not possessing their own transport,
- Provision of trains to take evacuees away from the area,
- Provision of emergency evacuation centres on safe ground.
- Provision of crime prevention/anti looting patrols
- Provision of Ambulances (including private & volunteer agency ambulances) for transport of sick and infirm to healthcare off site

Serial 4 Vulnerable Premises – Defence hardening

(Seamless communications across and within core and support agencies - security, reliability, quality & auditability)

The eastern half of the residential area has been assessed as not at high risk provided flood protection measures are implemented**.** At this stage ground commanders are making use of any fixed infrastructure within their command area e.g. police, fire or ambulance stations, local authority premises or vacant offices. Activities in this sector involve:-

- The digging of trenches and raised earth works to divert water flow from threatened property
- The deployment of flood protection equipment
- Provision of advice and guidance to people remaining in their premises

Serial 5 Damage Limitation

(Seamless communications across and within core and support agencies - security, reliability, quality & auditability

Expert advice dictates that the chemical plant and the power plant fit neither of the above tactical options. Consequently the decision has been taken at Incident command level to de-commission/power down both plants as soon as possible with the intent of preserving as much of the infrastructure for future use post crisis. At this stage ground commanders are making use of any fixed infrastructure within their command area e.g. police, fire or ambulance stations, local authority premises or vacant offices. Activities in this sector involve:-

- Deployment of flood protection equipment on a localised site basis
- Where practicable the safe movement of toxic chemicals from the chemical plant to safe ground with escort as required
- The movement of transportable plant and infrastructure to safe ground
- The movement of transportable equipment and portable chemicals to higher floors within the plant

Serial 6 Media

(Seamless communications between and within all involved agencies at strategic and incident command level – security, quality & auditability)

The need arises from early on throughout the operation for media briefings. There is a need for all the agencies involved to work to a cohesive media strategy and for the ability of commanders at strategic and incident command levels for to be able to contribute to planned media briefings and statements by means of exchange of data as draft briefings are worked up; also to be able to deal themselves, assisted by internal agency prepared briefing packs, with miscellaneous and ad hoc media requests.

Serial 7 Reservoir Walls Breached

(Seamless communications between and within agencies and across international borders - high speed, reliability, quality & auditability)

Contrary to expert advice the walls are breached within 48 hours. The strategy for the crisis is now focused very much on the preservation of life with urgent messages about the impending flood water being communicated to all deployable resources for each agency; and to Country B via strategic and incident command levels.

It is during this phase of the crisis that flooding water from the reservoir sweeps through the valley causing large numbers of deaths of the public and ER agency personnel with the torrent of water taking several bodies through the valley and across the international border into the adjacent country and onto the environmentally protected deep harbour. Scores of bodies and survivors are situated across both countries with many survivors finding themselves in the sea. Mobile phone and other telecommunications infrastructure is eventually lost or severely damaged. Agency contingency and operational plans are enacted for the rescue of survivors.

Serial 8 Flooded Tunnel

(Seamless communications between agencies and across borders - high speed & reliability)

The huge body of water also causes landslides that impact on the power station cutting the remaining power feeds that have not already been closed down. This rising water level in the valley floods into the road tunnel. Emergency responders from both countries attend their respective ends of the tunnel and deploy to rescue people trapped inside by water. The need arises for a coordinated response at both ends of the tunnel. At ground command level Country A responders rely upon tetra radio and satellite phones; Country B responders rely upon VHF radio

Serial 9 Amateur Radio

(Seamless communications between agencies and across borders, high speed & reliability)

Information comes to light from an amateur radio enthusiast living in a high rise building within the town that there are groups of individuals floating in the discharged water appearing to be at risk and require rescuing. This cannot be verified in police/fire helicopters as they are deployed elsewhere in the incident. Country B's Air/Sea rescue helicopters are deployed and are talked in by the radio enthusiast using his equipment.

Serial 10 Disaster Victim Identification

(Seamless communications between agencies and across borders, security reliability quality and auditable)

Country A has now mobilized its standby temporary mortuaries, survivor reception centres, and casualty bureau to assist with dealing with enquiries from worried relatives also to support the identification process of the dead and injured. Coroners in both countries have also been appointed.

Bodies from Country A are being recovered in its own country and in Country B by agencies from both countries and deposited in mortuaries in both in Countries. There is a concern that some of the dead from Country B could possibly deposited in Country A.

Survivors from Country A are rescued in both countries and deposited in hospitals and survivor reception centres in both countries. There is a concern that some survivors found in County B are in fact Country B citizens and that they could have been deposited in hospitals in Country A

Serial 11 Chemical Plant Noxious Smoke Cloud

(Seamless communications between agencies and across borders, speed security reliability quality and auditable)

It is at this point information comes to light through rumours at working level that the chemical plant illegally had on its premises large quantities of unlicensed and dangerous chemicals and that it had failed to remove them from the plant in time; shortly after there is a large explosion at the plant and a massive plume of smoke is seen originating from the chemical plant.

This smoke plume forms into a large toxic gas cloud and with the northerly wind starts to spread the plume over into country B. Chemical plant management own up about the illegally stored chemicals. Expert advice on the chemicals held at the plant suggests this toxic gas cloud will be harmful to people with the elderly and the young at greatest risk - possibly fatal. The plume is monitored by Country A's helicopter with live video feed to ground based control rooms

Some of the dead and injured are displaying particular types of body burns indicative of being in the vicinity of the chemical plant and in particular the toxic gas cloud; health agency advice is

needed before rescuers and body recovery teams can deal with them on both sides of the international border.

Serial 12 Investigation - (Security, quality, auditable, reliability)

A multi disciplined team has now been assembled to commence the investigation for the public enquiry in Country A. There is a separate criminal enquiry into the illegally stored chemicals. This will involve seizure of all incident logs, videos photos etc and the requirement for investigators to have discrete communication channels secure from the rescue operation.

Serial 13 Business Continuity (Reliability, quality & security)

The management of the incident is moving more into a consolidation phase but at this point the power to the school where the incident command is situated is lost for an unknown reason. The agencies involved respond accordingly and at a minimum requirement voice communications are necessary for command and control activities within and across all involved agencies

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